

ABSTRACT FORM
1993 ANNUAL MEETING, ECOLOGICAL SOCIETY OF AMERICA

DEADLINE **FOR** RECEIPT OF **SUBMITTED** ABSTRACTS IS **31 JANUARY 1993**. Mail the original plus 5 copies to **Dennis F. Whigham, ESA Program Chair, Smithsonian Environmental Research Center, Box 28, Edgewater, MD 21037**. Please read all instructions in the *Bulletin of the Ecological Society of America* ("Call for Posters and Papers," September 1992, 73(3):156-158) before typing on this special form.

Author to contact: Dr. Kyle C. McDonald
Institution: Jet Propulsion Laboratory
Address: Main Stop 300-233
4800 Oak Grove Drive, Pasadena, CA 91109
Phone number: (818) 354-8225 Who will present the paper? McDonald
Oral contributed paper ☒; Poster session ☐; Invited symposium paper ☐; ESA member ☐ ☒.
Audiovisual equipment required: 35-mm slide projector ☐ Other Viewgraph Machine yes
Session topic code (see *Bulletin* 73(3):157-158): First choice 39; Second choice 02; Session topic if choice 1
"Other" (04 or 42): _____

MCDONALD, K. C., R. ZIMMERMANN, R. OREN and J. B. WAY. Jet Propulsion Laboratory, Pasadena, CA, 91109, USA and Duke University, School of Forestry and Environmental Science, Durham, NC, USA. Hydrologic and dielectric properties of woody plant tissue: Implications for remote sensing of canopy water status.

The ability to remotely sense canopy water status would greatly improve the capability to estimate canopy carbon, water and energy budgets using remote sensing techniques. Since radar is sensitive to dielectric constant, it should be possible to couple radar backscatter to canopy water status via the dielectric constant. Our studies indicate that a direct link exists between the dielectric constant of woody plant tissue and xylem water potential. For example, diurnal observations of an orchard of English walnut trees demonstrate that water potential changes of -2 MPa (-20 bars) result in an order of magnitude change in the dielectric constant. Other experiments performed to verify this relationship have demonstrated a direct cause-and-effect relationship between xylem water potential and the dielectric constant measured in the bole of the tree. Coupling these data to radar backscatter measurements demonstrate the capability of using remotely sensed data in ecological studies of canopy water relations. *This work was carried out at the Jet Propulsion laboratory, California Institute of Technology, under contract to NASA.*

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PLEASE NOTE: Submitting this abstract is a guarantee from you that the research reported has been completed and will not have been published before the time of the meeting.

INSTRUCTIONS:

1. Your entire abstract—including **AUTHOR(S)**, Institution, City, STATE, zip code, COUNTRY, and Title—must be typed within the blue rectangle. Leave no margins at the top or on the left side within the rectangle and continue lines as near the right margin possible. Do not touch the blue line. Practice typing the abstract before using the form.
2. Capitalize the **AUTHOR(S) NAME(S)**, and place the senior author's last name first. Indent 4 spaces after the first line of the citation. Leave a blank line between the title and abstract text.
3. Use a high quality printer (no older dot matrix) or a typewriter with a carbon ribbon. Single space all typing except for the citation. Use a font no smaller than in the example below. There should be no more than 17 typed lines, including the citation. Make certain that the copy is clean with all letters **fully typed and no typographical errors**. If you photocopy this form, make certain that the blue-lined rectangle does **not show up as black lines**. See the *Bulletin* for additional instructions.

EXAMPLE:

MURPHY, PETER G. and REBECCA R. SHARITZ. Michigan State University, East Lansing, MI, 48824, USA and Savannah River Ecology Laboratory, Aiken, SC, 29801, USA. Long-term recovery of northern hardwood forest following gamma irradiation.

A northern Wisconsin hardwood forest was exposed to 3300 hours of point-source gamma irradiation from 3 May to 16 October, 1972. Cumulative . . .